



Chapter 2 Environmental Threats

This chapter explains how several key environmental toxins affect children. Each section contains information on the hazards of the environmental threat, where it can be found, and three types of guidance:

1. What the law states you **MUST** do.
2. What you **SHOULD** do beyond what is required by law to further protect your children and staff.
3. What you should **CONSIDER** to stand out as an environmental and safety steward in your community.

2.1 LEAD

About one in six children in America have high levels of lead in their blood, according to the Agency for Toxic Substances and Disease Registry. In Indiana, according to 1994-1998 baseline data from the Indiana Childhood Lead Poisoning Prevention Program, 9.8% of 171,590 children screened under or equal to six years of age had an initial blood lead level above 10 ug/dL (micrograms per deciliter of whole blood). Blood lead levels as low as 10 ug/dL are associated with harmful effects on children's learning and behavior.

Lead is more dangerous to children than adults because children's growing bodies absorb more lead, and their nervous systems and brains are more sensitive to lead's damaging effects. Babies and young children put most everything in their mouths, and these objects may have lead dust on them.

Lead-based paint in older homes or other facilities is the most important remaining source of lead exposure for U.S. children. U.S. EPA banned lead from paint in 1978. Lead-based paint most likely will be present in your facility if it was constructed or renovated before 1978, especially if it was built before 1950.

Facilities hooked up to private well-water systems may be at greater risk for lead in drinking water than facilities hooked up to public utilities. The best way to evaluate your facility's risk for lead is to walk through the lead section in IDEM's Self Assessment booklet.

Health Effects

The long-term health effects of lead in children can be severe, and even result in death. Even small amounts can impact a child's healthy development. Research has demonstrated that childhood exposure to unsafe lead levels can cause learning disabilities, decreased growth, hyperactivity, dizziness, clumsiness, impaired hearing, brain damage, paralysis, and convulsions. In pregnant women, lead exposure can pass through the body to the unborn child, resulting in miscarriage or birth defects.

WATCH FOR THE SIGNS OF LEAD POISONING:

- | | |
|-----------------------------|------------------------------|
| < flu-like symptoms | < weight loss |
| < abdominal pain/discomfort | < seizures |
| < headaches | < coma |
| < anemia | < loss of hearing |
| < weakness | < diminished motor skills |
| < vomiting | < diminished mental capacity |
| < fatigue | < damage to organs |
| < sleep disorders | < emotional behavior |
| < hyperactivity | < Attention Deficit Disorder |
| < poor appetite | < paralysis |
| < constipation | < death |

Some parents and teachers may regard these signs as "just part of growing up." However, lead poisoning symptoms should not be ignored. The only way to know if a child has lead poisoning is through proper blood testing.

Where is lead?

You may have lead around your building without knowing it because you can't see, taste, or smell lead.

Lead can be in:

- < dust
- < paint
- < soil
- < pipes
- < drinking water
- < mini-blinds
- < food made with lead-contaminated water
- < imported ceramic dishware and crystal glassware

Before scientists, health practitioners, and policy makers knew about lead's harmful effects, it was used widely in paint, gasoline, water pipes, mini-blinds, and many other products. Now that the dangers of lead are known, most paint is lead-free, leaded gasoline is being phased out, and household plumbing no longer is made with lead materials. However, if lead is present in your facility, it will not break down naturally. Lead remains a potential hazard until it is contained safely or removed properly.

Lead-based paint

Children are exposed to lead-based paint when they eat lead-based paint chips or inhale or ingest lead-based paint dust. Most businesses and homes built before 1950 contain heavily leaded paint. Some buildings constructed as recently as 1978 also may contain lead-based paint. This paint may be on window frames, window sills, walls, doors, door frames, stairs, railings, banisters, shelves, or bookcases. Outside, it can be found on porches, fences, on your facility's exterior, in the soil, or on your neighbor's property.

Lead dust is a poison. It can form when lead-based paint is dry scraped or heated. Dust also forms when surfaces covered with lead-based paint are bumped or rubbed, such as opening a window or door. Settled lead dust can re-enter the air when you vacuum, sweep, or walk through an area. Children can inhale or ingest lead when they put their hands in their mouth after crawling on the carpet or floor where lead dust has been tracked.

Lead in soil can be a hazard when children play in bare soil. Also, people can bring lead-contaminated soil inside on their shoes, impacting indoor areas where children crawl and play. Lead in soil can come from paint chips that fall off your facility, a neighboring building or fence, dust from the house exterior, air deposits of leaded gasoline vapors, or discharges from lead smelters.

Lead-based paint that has been covered by several layers of water-based paint usually is not a hazard unless the paint is cracking or peeling. However, in friction areas, such as where doors and windows open and close, dust from lead-based paint, even several layers down, can be emitted into the air children breathe.

Fortunately, reducing the risk of lead poisoning in children is relatively simple and inexpensive, as the following requirements and recommendations demonstrate.

You MUST:



- ' **Ensure that all equipment, surfaces, and items with which employees and children come in contact, including toys, cribs, jumpers, and play pens, are free of lead-based paint chips or dust.** (OSHA, FSSA) If during an inspection, FSSA finds that lead-based paint is a threat to children and staff, you will have to present a plan for repair to the Child Care Health Section at FSSA. Contact FSSA for guidance.



- ' **Use a licensed contractor to remove lead-based paint if the intent is to remove the paint permanently.** (IDEM) It takes a properly trained expert to remove lead-based paint correctly. Some of the hazards of improper lead-based paint work:
 - < Dry scraping or sanding lead-based paint can generate large amounts of lead dust
 - < Heating lead-based paint may release dust into the air
 - < Ingesting lead-based paint or inhaling vapors can occur during improper cleanup activities
 - < Lead dust from poorly done repairs or renovations of older buildings can remain in the building long after the work is completed.

It is highly recommended that you also use licensed contractors for other lead-based paint activities because of the inherent dangers of lead-based paint, although the law does not require it. Licensed lead-abatement contractors have been trained in proper lead removal. IDEM maintains a list of licensed contractors who have been trained and certified to remove lead-based paint. Call IDEM's Asbestos/Lead Section at (800) 451-6027, ext. 33861 or (317) 233-3861 for the most current list.



(any facility that has one or more employees)

- ' **During renovations, repair, or cleaning activities, you must protect your employees and construction workers, in addition to children.** (OSHA) Employers must protect employees from exposure to airborne concentrations of lead above 50 micrograms per cubic meter of air (50 ug/m³) over an 8-hour period. Call OPPTA to determine what protective equipment is necessary for varying levels of work on lead-based painted surfaces.



- ' **Inform employees if there is a potential exposure to any level of airborne lead.** (OSHA) You must explain the hazards of lead exposure to employees if there is any potential for exposure.



- ' **Perform any alterations or renovations without children or staff present.** (FSSA, OSHA) Children and pregnant women are especially at risk if exposed to unsafe levels of airborne lead.

You SHOULD:

- ' **Test at-risk children.** At-risk children are those who:
 - < live in low-income communities
 - < live or play in older housing, especially if the home is in poor condition or undergoing renovation
 - < have brothers, sisters, or playmates with high lead levels
 - < live with someone who is exposed to lead in the workplace or who has a hobby that uses lead (stained glass, pottery, etc.)
 - < live near a lead smelter, battery recycling plant, or other industry that releases lead into the air
 - < use hot water from the tap for cooking or drinking
 - < have a low iron count
 - < eat, drink, or cook from pottery or ceramicware containing lead.

Encourage parents of children who may have been exposed to lead to get their children tested by their doctor, health center, or local health department. A simple blood test can detect high lead levels. These tests are inexpensive and sometimes free. Blood tests for lead are especially important for children between six months to six years of age. Treatment can range from changes in diet, to medication, or even a hospital stay in severe cases.

- ' **Leave lead-based paint alone before covering it.** Leave lead-based paint undisturbed if it is in good condition. DO NOT SCRAPE, SAND, OR BURN lead-based paint. Chemical removers involve a wet removal process, which is preferred; however, all chemical removers involve hazardous chemicals. Follow directions carefully and use the recommended protective equipment when using chemical removers. Remember, a licensed contractor must perform all lead-based paint removal activities if your goal is permanent removal. Contact IDEM for a list of certified contractors.
- ' **Cover lead-based paint.** If you are not removing lead-based paint permanently, enclose the undisturbed lead-based paint with water-based paint, wall paper, or contact paper. Remember, covering high-friction areas, such as window sills, window frames, and door frames, will not prevent lead dust emitted from the lead-based paint underneath. NOTE: it is against licensing or registration regulations to do this work when staff or children are present.
- ' **Contact your landlord.** If you rent, notify your landlord of peeling or chipping paint.
- ' **Discard paint chips safely.** Clean up lead-based paint chips immediately with *wet* paper towels. When the paint chips or dust are wet, they will not emit lead dust. Discard in double-layered heavy-duty trash bags. Add enough water to the trash bag to dampen the paint chips and seal bags tightly. Discard bags in your normal trash collection
- ' **Dust with wet rags or mops.** Clean window frames, window sills, and other surfaces that create friction when opened with wet rags or mops as often as necessary to pick up small chips or dust. Also clean the floor, rug, or carpet around these friction areas. Use a mop or sponge with warm water and a general all-purpose cleaner. Thoroughly rinse sponges and mop heads with dish soap or an all-purpose cleaner after each cleaning.
- ' **Wet clean carpets annually.** Wet cleaning carpets where lead dust may accumulate will reduce children's exposure to lead paint dust. However, make sure the carpeting dries thoroughly to prevent mold, which can cause asthma or irritate allergies (For more on respiratory irritants, see Section 2-4).
- ' **Wash hands.** Children put just about anything in their mouths, including soil or paint chips. If your facility is at risk for lead contamination, wash children's hands often, especially before they eat, and before nap time and bed time. Prevent children from chewing or sucking on window sills, banisters, or other painted surfaces.
- ' **Use low-odor, water-based paints.** The paint should be dry and vapor smells nondetectable before children re-enter newly painted rooms.
- ' **Clean toys.** Keep play areas clean. Wash and sanitize bottles, pacifiers, toys, and stuffed animals regularly.

- ' **Use a door mat and wipe your shoes.** Clean or remove shoes before entering the facility to avoid tracking in lead from potentially contaminated soil. Wash the door mat regularly (do not shake it out where children play!) to help keep contaminants out of the building.
- ' **Check your mini-blinds.** If you have mini-blinds, contact the manufacturer to ensure your blinds are lead free. Replace mini-blinds that contain lead. Dust mini-blinds with a wet cloth if they contain lead or if you are not sure if they contain lead.
- ' **Eat healthfully.** Make sure children eat nutritious, low-fat foods that are high in iron and calcium. Examples include: spinach, low-fat dairy products, tofu and lean meats, such as pork. Children with healthy diets will absorb less lead.
- ' **Test your soil if your facility is located near a lead smelter.** If your facility is located near manufacturers that use large amounts of lead, you should test your soil. Indiana has only a few lead smelters, including RSR Quemetco Inc. in Indianapolis; Exide Corp. in Muncie; and Hammond Lead Products Inc. in Hammond.

You should CONSIDER:

- ' **Getting a lead risk assessment.** Have your facility and soil checked for lead hazards through a lead risk assessment. Lead risk assessors will take dust wipe, peeling paint, soil, and water samples for lab tests. If you do choose to have a lead risk assessment, it must be conducted by a licensed individual (see Chapter 7: Resources).

**IDEM IS OFFERING FREE LEAD RISK ASSESSMENTS TO
CHILDCARE FACILITIES PARTICIPATING IN THE 5-STAR
ENVIRONMENTAL RECOGNITION PROGRAM.**

**AN ASSESSMENT INCLUDES PAINT, WATER AND OTHER
LEAD-BASED PRODUCTS. FOR MORE INFORMATION CALL
(800) 988-7901.**

LEAD IN DRINKING WATER

High levels of lead in drinking water are a significant source of lead exposure for children. Lead levels are likely to be high if your facility has any of the following:

- < lead pipes
- < copper pipes with lead solder (material used to unite pipes)
- < brass faucets or fittings.

Even if you are connected to a city or town water supply, which treats drinking water for contaminants, lead still can enter your drinking water through your facility's own plumbing.

A surprising fact--data indicate that the newer the building, the greater the risk of lead contamination in the water. Why? Lead levels in water pipes decrease as the building ages. Over time, mineral deposits coat the inside of pipes, which insulate the water from the solder. During the first several years after construction, before this coating forms, water is in direct contact with the lead in the solder. This coating may form more rapidly if you have hard water.

Facilities that are very old also are at high risk for lead-contaminated drinking water. Plumbing installed before 1930 most likely contains lead pipes or solder. Copper pipes have replaced lead pipes in most plumbing; however, the use of lead solder to connect the pipes is widespread. In fact, experts regard lead solder as the major cause of lead contamination in drinking water today.

U.S. EPA's Office of Ground Water and Drinking Water reports that brass fittings and plumbing fixtures that contain 8% or less lead have been found to contribute high lead levels for a considerable period of time after their installation. To learn if your brass faucet meets safe drinking water standards, contact the NSF (National Sanitation Foundation) International at (800) NSF-MARK or www.nsf.org, or Underwriters Laboratory (UL) at (847) 272-8800 or www.ul.com.

You should be concerned that your water may have lead contamination if:

- < your pipes or solder at the main shutoff valve are a dull gray metal that is soft enough to be scratched with a house key (these are probably lead pipes)
- < you see signs of corrosion, such as frequent leaks
- < your non-plastic plumbing was installed before 1986, the year lead solder was banned.

You MUST:



- ' **Test for lead in your drinking water if your facility is served by a well and you have more than 25 people in your facility.** (IDEM) Contact IDEM's Drinking Water Branch, (317) 308-3282, to learn about the testing and monitoring requirements. Several factors determine these requirements, such as building occupancy and location. If your facility is hooked up to a city or town water supply then no testing is required, unless the Indiana State Department of Health notifies you otherwise.



- ' **Use lead-free pipes and materials in new construction.** (U.S. EPA) There are no state or federal laws that require businesses or homes to address lead in drinking water. However, under the Safe Drinking Water Act, U.S. EPA requires that utilities must ensure that water from a customer's tap does not exceed 15 parts per billion of lead to water. In 1986, President Reagan signed amendments to the Act, requiring that "lead-free" pipes, solder, and flux must be used in the *installation or repair* of any public water system or plumbing in residential or non-residential facilities connected to a public water system. This ban of lead material in drinking water systems applies only to *new* plumbing or repairs-not existing plumbing structures or pipes.

You SHOULD:

- ' **Flush your pipes before drinking or cooking.** Whenever water in a faucet has not been used for six or more hours, “flush” the cold-water pipes by running the water at least 30 seconds or until it becomes as cold as it will get. This could take as little as five to 30 seconds if there has been recent heavy water use, such as showering or toilet flushing. The more time the water has been in contact with pipes or fixtures containing lead, the more lead it may contain.
- ' **Use cold water for drinking or food preparation.** Use water from the cold-water tap only for drinking, cooking, and especially for making infant formula. Hot water can contain higher lead levels because lead dissolves more quickly in hot water. If you need hot water, draw water from the cold water tap then heat it. Boiling water will not eliminate lead contamination.
- ' **Get your water tested.** The only way to be sure of the amount of lead in your water is to have it tested by the Indiana State Department of Health, local health departments, or a laboratory certified by the Indiana State Department of Health. For more information on drinking water testing, contact:
 - < Indiana Family Helpline at (800) 433-0746
 - < Indiana Department of Environmental Management, Office of Water Management, Drinking Water Branch, 2525 North Shadeland Ave., P.O. Box 7148, Indianapolis, IN 46207-7148, Contact: Stacy Jones, (317) 308-3292
 - < Indiana State Department of Health web site at: www.state.in.us/doh/html/labserv/certfr.htm
 - < Your public water supplier.

You should CONSIDER:

- ' **Contacting your utility.** If you are served by a city or town water system, contact your supplier (the company on your water bill) and ask whether or not the supply system contains lead service lines, or if the system has been tested for lead. If either answer is yes, ask what the lead levels are in the system. If the levels are equal to or greater than 15 parts per billion, ask what steps the supplier is taking to address the lead contamination. Drinking water can be treated at the plant to make it less corrosive, and water mains and connections containing lead under the jurisdiction of the supplier can be replaced.
- ' **Treating your well.** If you own a well or another water source, you can treat the water to minimize lead contamination. IDEM recommends using corrosion control products. Contact your local county health department, NSF (National Sanitation Foundation) International, the Indiana State Department of Health, or IDEM's Drinking Water Branch for assistance in finding these commercially available products (see Chapter 7: Resources).

OTHER POTENTIAL LEAD SOURCES:

Glazed pottery: Use glazed pottery only for display and keep out of children's reach, if you do not know whether it contains lead.

Leaded crystal glassware or stemware: Use leaded crystal glassware or stemware only for display and keep out of children's reach, if you do not know whether it contains lead.

Leaded gasoline fumes: Facilities that have bare soil in outdoor playgrounds located near parking lots or busy streets should test soil for lead. Leaded gasoline fumes may have deposited lead in the soil before 1978, when leaded gasoline was banned.

On the job: If employees' or parents' work or hobbies involve lead, they should change clothes and remove shoes before entering a child care facility. Their work clothes should be washed separately from children's laundry.

Food cans: Never store food in open cans; keep it in glass, plastic, or stainless steel containers. The lead solder used to seal food cans can mix with the food in the can. The United States banned the use of lead solder in cans in 1995, but still is used in other countries. Lead solder may be found in cans imported into the United States.

2.2 ASBESTOS

Asbestos is a mineral fiber the building and construction industry used in more than 3,000 different building products, including: pipe and furnace insulation, shingles, millboard, textured paints, wall and ceiling coating materials, floor tiles, and as a fire-retardant.

Today, asbestos is found most commonly in older homes. Many manufacturers have limited the use of asbestos voluntarily, although there has been no legal ban in the United States.

Even if asbestos is present in your facility, it may not be a serious problem. The mere presence of asbestos in a home or a building is not hazardous. The danger is that asbestos materials may become damaged over time and release microscopic fibers into the air. Inhaling these fibers is extremely dangerous. **THE BEST APPROACH FOR ASBESTOS MATERIAL IN GOOD CONDITION IS TO LEAVE IT ALONE!** Disturbing undamaged asbestos may create a health hazard where none existed before. Cutting, sanding, or other remodeling activities can disturb asbestos, causing it to become airborne, which is most dangerous to health.

Asbestos can be either friable or nonfriable. The state and federal government regulate friable asbestos because it is extremely dangerous.

Friable asbestos can break easily and be crumbled in one's hand. It *may* be found in pipe insulation, fireproofing materials, plaster, and ceiling tile.

Non-friable asbestos, when dry, cannot be crumbled, pulverized, or reduced to powder either by hand pressure or reasonable mechanical forces. Examples of non-friable asbestos materials are roofing, floor tile, and siding.

Health Effects

The most dangerous asbestos fibers are too small to be visible, but after they are inhaled, they can remain and accumulate in the lungs, potentially causing lung cancer, mesothelioma (a cancer of the chest and abdominal linings), and asbestosis (irreversible lung scarring that can be fatal). Symptoms of these diseases do not show up until many years after exposure began. Most people with asbestos-related diseases were exposed to elevated concentrations on the job; some developed problems from exposure to clothing and equipment brought home from job sites. Studies have shown that smokers are at higher risk of developing asbestos-induced lung cancer.

You MUST:

- ' **Communicate asbestos hazards to employees.** (OSHA) Building and facility owners must maintain records of the presence, location, and quantity of presumed asbestos-containing materials. OSHA requires that employers communicate the hazards of presumed asbestos-containing materials located in all buildings to employees who may be exposed to these materials. For example, an employer must post a sign outside a mechanical room where a pipe containing asbestos is located. The sign must:
 1. Identify the presumed asbestos containing material.
 2. Identify the location of the presumed asbestos containing material.
 3. Identify the appropriate work practices, which, if followed, will ensure the presumed asbestos containing material will not be disturbed.
 4. The pipe must also be labeled. The label must say:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD

(The following asbestos rules apply to home businesses, including child care facilities)



- **Maintain friable asbestos in safe condition.** (FSSA) If the asbestos material is in good shape and will not be disturbed, do nothing! But, if it is friable or you are suspicious of it becoming friable, a licensed asbestos contractor must either repair or remove the asbestos material. Repairing usually involves proper sealing (encapsulation) or covering, then tagging the material so that you and future building contractors and owners know where the asbestos is located.



- ' **Have your facility inspected before renovation.** (IDEM) Indiana law requires that prior to renovation or demolition activities for any commercial, industrial, or institutional facility (including residential structures and apartment buildings where there are five or more dwelling units), you must have the facility or the affected part of the facility inspected by a licensed asbestos inspector to determine the presence of asbestos. This regulation applies regardless of the year your facility was built. It is required by the Indiana Emission Standards for Asbestos Demolition and Renovation Operations. Contact IDEM's Office of Air Management, (800) 451-6027, ext. 33861, or (317) 233-3861, for a current list of licensed asbestos contractors.



- ' **Use licensed contractors.** (IDEM) Indiana regulations require that licensed asbestos contractors be used for any disturbance or removal of *friable* material at least three linear feet (which is the measurement on or off pipes), three square feet on or off facility components (any part of a facility, including equipment), or a total of .75 cubic foot on or off all facility components. If you are not clear whether your components meet this standard, contact IDEM's Office of Air Management, (800) 451-6027, ext. 33861, or (317) 233-3861, for assistance. When a renovation is going to affect non-friable material, always make sure the contractor's work practices will not cause it to become friable. Ensure licensed contractors also follow applicable OSHA standards to protect employees (See Chapter 7: Resources to obtain asbestos regulations.)



- ' **Ensure your contractor disposes of your asbestos properly.** (IDEM) Your facility always is responsible for the proper disposal of waste, regardless of the contractor used. It is imperative that your contractor disposes of asbestos waste--a highly regulated material because of its hazard risk--correctly. Ensure that the contractor wets, wraps or bags, and labels asbestos waste, and that it is taken to a landfill approved to accept "asbestos" waste. If the contractor disposes of it improperly, you may be held liable.

You SHOULD:

- ' **Have a licensed inspector perform an asbestos inspection.** Asbestos is so dangerous that only professional, licensed asbestos contractors who have been trained specially to handle it should do the work. DO NOT TAKE SAMPLES YOURSELF since there may be an increased health risk if fibers are released.
- ' **Do not touch asbestos that you are leaving alone.** However, visually inspect the material for damage or deterioration. NEVER touch, examine, or sample asbestos-containing materials in the presence of children.
- ' **Contact IDEM or your local health department immediately in the event of an asbestos release.** Close off the portion of the facility in which the release has occurred so that people will not be exposed. Close off air ducts and vents, seal windows, and tape bottoms of doors to prevent drafts, until the problem is fixed. Do not turn off fire alarms or sprinkler systems in the affected portion.

You should CONSIDER:

- ' **Developing an asbestos management plan for your facility.** Indiana schools are required to have these plans. For more information, contact Frank Profit at IDEM's Office of Air Management, (800) 451-6027, ext. 33861, or (317) 233-3861. In addition, you should check with your local county health department for possible requirements for child care facilities. See Chapter 7: Resources.

Additional information on asbestos is available on EPA's Asbestos Homepage at:
www.epa.gov/opptintr/asbestos/pubs.htm#ombudsman.

2.3 RADON

Radon is a naturally occurring radioactive gas that results from the decay of uranium in clay soil. When radon breaks down, its decay products can be inhaled, presenting a health hazard. The potential danger of radon in your facility may remain hidden because radon is odorless, colorless, and tasteless.

Radon typically moves up through the ground to the air above and concentrates in a home or building through cracks and other holes in the foundation. Any building can contain radon, whether the building is old or new, well-sealed or drafty, with or without basements. Radon gets into the building through:

- < cracks in solid floors
- < construction joints
- < cracks in walls
- < gaps in suspended floors
- < gaps around service pipes
- < cavities inside walls
- < the water supply.

Radon is measured in picocuries per liter (pCi/L). About 0.4 pCi/L of radon occurs naturally outdoors. The average indoor radon level is estimated to be about 1.3 pCi/L. U.S. EPA is concerned especially about indoor radon levels at or above 4pCi/L. In Indiana, approximately 29% of homes have radon levels above 4 pCi/L, but with proper controls, also known as mitigation, some buildings can be reduced to 2 pCi/L or below. EPA recommends that home or building owners take action to reduce radon in a building if the annual concentration is 4pCi/L or greater.

Health Effects

Radon is the second leading cause of lung cancer, following smoking. Smoking and radon exposure together greatly increase lung cancer risk.

You MUST:



- ' **Use a state-certified radon tester or mitigator if you hire a professional to perform radon testing or mitigation (reduction).** (ISDH) Building owners may do their own radon testing; however, the Indiana State Department of Health highly recommends that you hire a certified mitigator to reduce radon in homes and buildings. Contact ISDH for the most current list of state-certified testers or mitigators.

You SHOULD:

Test your building. Testing is the only accurate way to determine radon levels. U.S. EPA, the Surgeon General, and the Indiana State Department of Health strongly recommend that all buildings be tested for radon. This can be done quickly and inexpensively. You should purchase radon test kits that have a U.S. EPA-certification designation. Note: U.S. EPA stopped certifying radon test kits in September 1998. However, the Indiana State Department of Health has a list of certified providers. Hardware stores and some county health departments sell radon test kits, as well.

U.S. EPA recommends performing a short-term test first. If your result is 4 pCi/l or higher, then repeat the short-term test or perform a long-term test to ensure the data.

Follow instructions carefully when self testing. It's better to test in the winter when the building is closed up.

- ' **Use experts to fix the problem.** U.S. EPA and the Indiana State Department of Health recommend that you use a qualified contractor or mitigator to fix your building because lowering high radon levels requires specific technical knowledge and special skills. Without the proper equipment or technical knowledge, you actually could increase your radon level or create other potential hazards. But, if you decide to do the work yourself, get information on appropriate training courses and copies of U.S. EPA's technical guidance documents from the Indiana State Department of Health. The state also can provide guidance on choosing a state-certified radon mitigator. These mitigators use a variety of methods to reduce radon, such as sealing cracks in floors and walls and installing pipes and fans. Retest after radon mitigation to ensure your levels have dropped.
- ' **Learn more about radon health risks, testing, and mitigation.** Call the Indiana State Department of Health for these U.S. EPA documents:
 - < Consumer's Guide to Radon Reduction
 - < Citizen's Guide to Radon (residential)
 - < U.S. EPA's Mitigation Standards (what contractors must do for radon reduction)
 - < Radon Measurement in Schools
 - < Reducing Radon in Schools
 - < Radon: A Physician's Guide
 - < Home Buyer's and Seller's Guide to Radon (real estate transactions)

These guides also can be found on the EPA web site at www.epa.gov/iaq/radon/pubs/index.html. For additional radon information, contact the Indiana State Department of Health, (800) 272-9723. ISDH also has these documents available:

- < Indiana State Department of Health NOTICE (radon summary)
- < A list of Indiana Certified Radon Laboratories (to purchase radon kits)
- < A list of Indiana Certified Radon Testers and Mitigators

2.4 CARBON MONOXIDE

You can't see or smell carbon monoxide, but at high levels it can kill humans and animals in minutes. The human body absorbs carbon monoxide 50 times faster than oxygen, causing suffocation.

Carbon monoxide is produced when fuel, such as gas, oil, kerosene, wood or charcoal, burns. If you maintain and use fuel-burning appliances properly, the amount of carbon monoxide produced usually is not hazardous. However, hundreds of people die accidentally every year from carbon monoxide poisoning caused by malfunctioning or improperly used fuel-burning appliances. Even more die from carbon monoxide produced by idling cars.

Health Effects

Fetuses, infants, elderly people, or people with anemia or histories of heart or respiratory disease are especially susceptible to carbon monoxide poisoning. Symptoms of high-level poisoning, which can be fatal, include severe headaches, dizziness, mental confusion, nausea, and faintness.

Low levels of carbon monoxide poisoning can cause symptoms similar to the flu or food poisoning—shortness of breath, mild nausea, and mild headaches. These short-term symptoms could have long-term health effects if exposure continues.

IF YOU SUSPECT CARBON MONOXIDE POISONING:

- ✓ **GET FRESH AIR IMMEDIATELY.** Open doors and windows, turn off combustion appliances, and **LEAVE THE FACILITY.**
- ✓ **CALL 911 OR GO TO AN EMERGENCY ROOM IMMEDIATELY.** Tell the dispatcher or physician you suspect carbon monoxide poisoning. A blood test performed soon after exposure can confirm poisoning.

You **MUST:**



- ‘ **Vent gas water heaters outside.** (OSFM)



- ‘ **Ensure your gas equipment and appliances are in good working order.** (FSSA, OSFM) For licensed centers and registered ministries, all gas equipment and appliances and those used by contractors must comply with the provisions of the Indiana Mechanical Code in effect at the time that they were installed. For more information, contact Mara Snyder at the Office of the State Fire Marshal, (317) 233-5341.



- ‘ **Not use portable, unvented or open grate gas heaters.** (FSSA, OSFM)
- ‘ **Comply with state fire code if you use portable, unvented, oil-burning heating appliances in homes** (they are **absolutely prohibited** in centers or ministries). (FSSA, OSFM) The codes state they must be vented and you must use proper fuel in kerosene space heaters.



- ‘ **Do not store gasoline-powered engines in enclosed spaces.** (FSSA, OSFM) These include mowers, weed trimmers, snow blowers, chain saws, small engines, or generators. For licensed child care centers and ministries, gasoline-powered engines shall not be stored anywhere indoors.

You SHOULD:

- ‘ **In homes, never allow children to sleep in rooms with an unvented gas or kerosene space heaters.** Such space heaters are absolutely prohibited in centers and ministriesCsee above.
- ‘ **Install and use an exhaust fan vented outdoors over gas stoves.** If cooking on the stove produces grease-laden vapors, a hood system is required. Follow manufacturer’s instructions for installation.
- ‘ **Open flues when fireplaces are in use.**
- ‘ **Inspect all fuel-burning gas or electric appliances annually.** A trained professional should inspect oil and gas furnaces, gas water heaters, gas ranges and ovens, gas dryers, gas or kerosene space heaters, fireplaces, and wood stoves at the beginning of every heating season. Make certain the flues and chimneys are connected, in good condition, and not blocked.
- ‘ **Never idle cars in garages.** Even with the garage door open, fumes can build up rapidly in the garage and living areas of homes or buildings.

- ' **Never use gas ovens to heat the facility.**
- ' **Never use gasoline-powered engines in enclosed spaces.** These include mowers, weed trimmers, snow blowers, chain saws, small engines, or generators.

2.5 ASTHMA AND OTHER RESPIRATORY IRRITANTS

Childhood asthma is the leading chronic illness in U.S. children. Environmental pollutants commonly trigger asthma attacks in children who have a genetic or acquired predisposition to the disease. Children are particularly susceptible to air pollutants because they breathe a greater volume of air relative to their body weight.

Indoor Air Pollutants

Poor indoor air quality has been linked with asthma symptoms, as well as with other respiratory problems in children, such as increased frequency of respiratory infections, bronchitis, and pneumonia.

Indoor air pollutants often are referred to as biological contaminants. Biological contaminants can be molds, fungi, allergens, bacteria, mildew, viruses, animal dander, cat saliva, dust mites, cockroaches, and pollen. Tobacco smoke is another common and problematic lung irritant and health risk.

Biological contaminants, both indoor and outdoor, come from many sources. Pollens originate from plants; people and animals transmit viruses; people, animals, soil, and plant debris carry bacteria; and pets are sources of saliva, animal dander, and dung. In addition, the protein in urine from rats and mice is a potent allergen. When it dries, it can become airborne.

Contaminated central air handling systems are breeding grounds for mold, mildew, and other sources of biological contaminants, which a ventilation system may distribute throughout the building. Drapery, bedding, and other places where dust collects can harbor these contaminants.

Controlling the relative humidity level in a building can minimize the growth of some sources of biological contaminants. Standing water, water-damaged materials, or wet surfaces also serve as breeding ground for mold, mildew, bacteria, and insects. Dust mites are one of the most powerful biological allergens and can exist anywhere.

Health Effects

Asthma is a narrowing of the airways in the lungs that causes breathing difficulty. Some biological contaminants release disease-causing toxins and can trigger asthma attacks and other allergic reactions, including allergic rhinitis (an inflammatory response in the nasal passages). Symptoms may include nasal congestion, sneezing, or a runny or itchy nose) and hypersensitivity pneumonitis (a lung disease caused by exposure to a variety of inhaled agents).

Symptoms of allergic reactions to mold and mildew may include sneezing, watery eyes, coughing, shortness of breath, dizziness, lethargy, fever, and digestive problems. Recently a particular mold called *Stachybotrys atra*, found in homes with water damage, has been linked to bleeding lungs in infants, which can be fatal. Symptoms include coughing up blood and nosebleeds. Research shows that simultaneous exposure to *Stachybotrys atra* and tobacco smoke increases the chance of lung bleeding greatly.

Smoking. Some studies suggest exposure to passive smoke is responsible for between 150,000 and 300,000 annual lower respiratory tract infections in infants and children younger than 18 months, resulting in between 7,500 and 15,000 hospitalizations in the United States each year. Second-hand tobacco smoke has been found to have multiple health effects on children, including increased risk for:

- < lower respiratory tract infections, such as pneumonia and bronchitis
- < reduced lung function and symptoms of respiratory irritation, such as coughing, excess phlegm, and wheezing
- < middle ear fluid build-up
- < asthmatic symptoms
- < cancer (still under investigation).

Even if children are not exposed to second-hand smoke at your facility, they could be suffering the consequences of second-hand smoke at home. Educating parents about the harmful effects of second-hand tobacco smoke on their children is critical.

Histoplasmosis. Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called *Histoplasma capsulatum*. The fungus is most often located in soils high in nitrogen content. Animal droppings increase this nitrogen content. The animals themselves can carry infected soil over long distances. Children and others with undeveloped or threatened immune systems are particularly susceptible to the effects of histoplasmosis.

Histoplasmosis primarily affects lungs, although symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects), or they experience symptoms so mild they do not seek medical attention. If symptoms do occur, they usually begin within three to 17 days after exposure. The disease can appear as a mild, flu-like respiratory illness, with a combination of symptoms, including a general ill feeling, fever, chest pain, dry cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. Physicians arrest the disease with special antifungal medications. Mild cases usually are resolved without treatment.

To prevent histoplasmosis, staff and children should avoid situations where infected soil can become airborne, such as building demolitions where birds or bats have nested, landscaping or activities in soil with animal droppings, or simply playing in dirt with animal droppings. Only professionals with proper protective equipment should remove the infected soil to prevent accidental airborne exposures.

You MUST:

- ' **Prohibit smoking except in designated areas.** (FSSA, OSFM) In licensed child care centers, smoking is prohibited in the presence of children, in areas that will be occupied by children at any time, or in the kitchen. In ministries, smoking is only prohibited in the kitchen. The "Pro-Children Act of 1994" also prohibits smoking in Head Start facilities, and in kindergarten, elementary, and secondary schools that receive federal funding from the Department of Education, the Department of Agriculture, or Department of Health and Human Services (except funding from Medicare or Medicaid).



- ' **Use exhaust fans.** (FSSA, OSFM) Install and use exhaust fans that vent outdoors or through screened open windows in kitchens and bathrooms. Vent clothes dryers outdoors. The venting requirement is contained in the edition of the Mechanical Code in effect when the dryer was installed. Call the Department of Fire and Building Services, Technical Services Division, for more information, at (317) 232-1413.

You SHOULD:

- ' **Never smoke around children, especially where children play.**
- ' **Ensure that your air ventilation system is clean.** A well-designed ventilation system that is properly operated and maintained will, in most cases, take care of normal amounts of air pollutants automatically. Install new air filters quarterly. Make sure that drain pans are clean and slant toward the drain. Ensure that air handling units are clean.
- ' **Keep outdoor air intakes unobstructed.** Clear any obstruction, such as debris or clogged screens. Ensure that pollutant sources, such as dumpsters, loading docks, or areas where cars idle, are not located near the intakes. Check that outdoor air is moving into the intake grille by holding a small piece of tissue paper or light plastic at the intake grille. If it is working the tissue paper or plastic will move from the blowing air.
- ' **Prevent moisture build-up.** Ventilate the attic and crawl spaces to prevent moisture build-up. Humidity levels should be below 50% to control condensation, microbial growth, and dust mite activity. Thermometers purchased at hardware stores that measure temperature, humidity, and barometric pressure will help you monitor your humidity level. In times of high humidity, close windows and use an air conditioner and/or dehumidifier.
- ' **Clean humidifiers.** If using cool mist or ultrasonic humidifiers, clean the appliance according to manufacturer's instructions and refill with fresh water daily. Because these humidifiers can become

breeding grounds for biological contaminants, they have been linked to diseases such as hypersensitivity pneumonitis and humidifier fever. Evaporation trays in air conditioners, dehumidifiers, and refrigerators also should be cleaned frequently.

- ' **Clean or remove water damage.** Water-damaged carpets and building materials can harbor mold and bacteria. It is very difficult to completely rid such materials of biological contaminants. Thoroughly clean and dry water-damaged carpets and building materials (within 24 hours if possible) or consider removal and replacement. Always replace carpet padding if carpets have not dried within 24 hours.
- ' **Keep your facility clean.** Dust mites, pollens, animal dander, and other allergy-causing agents can be reduced, although not eliminated, through regular cleaning.
- ' **Do not vacuum or sweep when children are in the building.** Vacuuming actually can increase airborne levels of mite allergens and other biological contaminants. Central vacuum systems vented to the outdoors or vacuums with high-efficiency filters (HEPA filters) are helpful in deterring airborne dust.
- ' **Keep children away from soil with animal droppings.** To prevent exposure to histoplasmosis, keep children away from animal droppings in soil or construction/demolition areas.
- ' **Run water through unused floor drains and sinks.** Sewer gas is a build-up of a variety of chemicals, such as hydrogen sulfide, ammonia, and methane. Sewer gas may emit when drains are dry. Sewer gas can cause eye irritation, respiratory tract problems, dizziness, headaches, and nausea. Prevent sewer gas build-up and emissions by pouring a gallon of bleach water solution down drains not used routinely. FSSA's Child Care Health Section recommends using 100 parts per million bleach to water (approximately 1 teaspoon of bleach per gallon of water). If there is a severe odor, use a 10% bleach solution.

You should CONSIDER:

- ' **Limiting the number of indoor plants.** Although indoor plants are not a major source of mold spores, it is prudent to limit the number of houseplants because molds can grow in the dirt, and children may be allergic to the pollen in flowering plants.
- ' **Removing animals with fur.** Removing animals from a child care facility can be an emotionally charged issue, but many children are allergic to animal dander in the fur.

2.6 MERCURY

Mercury cycles through the environment from natural and man-made activities. It occurs naturally as a gas, liquid, or solid in rocks, soil, air, and living organisms. Humans have used it in dental fillings, thermometers, thermostats, blood pressure cuffs, lighting, electrical equipment, laboratory chemicals, and pharmaceuticals, among other commonly used materials.

Mercury emits into the air when fuel, such as coal, is burned or when waste containing mercury is incinerated. Eventually the airborne mercury ends up in some Indiana lakes and streams. Because the state has a large number of manufacturing industries and power plants that rely on coal-derived fuel to operate, mercury is one of the primary pollutants of concern in Indiana.

Inside the child care facility, IDEM is concerned about child and staff exposure to liquid mercury and ensuring that mercury-containing products are disposed of properly. IDEM and the U.S. Environmental Protection Agency are working together to prevent mercury pollution by educating industry and the public about mercury substitutions and how to keep mercury out of the waste stream through recycling.

Health Effects

Mercury is a nerve toxin that can impair the way we see, hear, walk, and talk. Fetuses and children are the most sensitive to mercury toxicity. When mercury enters waterways, bacteria and other processes can convert mercury into *methyl mercury*, which is the most toxic form of mercury. Methyl mercury bioaccumulates in fish tissue and may then be carried up the food chain to humans.

Direct human exposure to mercury can occur through eating contaminated fish. Exposure to high levels of fish contaminated with mercury has been associated with serious mental and physical retardation in infants. Lesser exposure can cause learning deficits and delayed walking and talking. In men, mercury can damage sperm.

Indiana, along with 38 other states, releases fish consumption advisories warning the public of the dangers of eating fish contaminated with mercury and polychlorinated biphenyls (see Section 2-7 for more information on PCBs.) The advisory is particularly important for children and for women who are nursing, pregnant, or planning to be pregnant because they can pass these contaminants on to the baby during pregnancy or breast-feeding. In children it can pass through the still undeveloped blood brain barrier to harm the brain. It takes up to one year for the body to eliminate mercury. Contact the Indiana State Department of Health, Indiana Department of Natural Resources, or IDEM for a free copy of the most recent Fish Consumption Advisory and additional pamphlets for women and children (See Chapter 7: Resources).

You MUST:

- ' **Use non-mercury, food-service approved thermometers in refrigerators and freezers.** (ISDH, FSSA) This regulation protects food from potential mercury contamination.

You SHOULD:

The following mercury items are priority materials only; however, many more items in your facility may contain mercury. See the mercury awareness brochure enclosed in this manual or the Self Assessment to find, recycle, or properly dispose of all items containing mercury in your facility. These materials should be recycled as soon as possible or at the end of their useful life. Make sure you tag items that contain mercury so that they do not end up in a landfill.

- ' **Identify and label mercury-containing items in your facility.** Go through IDEM's mercury awareness brochure or Self Assessment to ensure children are protected from mercury-containing items and that they are recycled, rather than disposed of in a landfill.
- ' **Cleanup mercury spills properly!** See Indiana's Mercury Spill Guidance on the next pages.
- ' **Replace mercury thermostats with electronic thermostats.** Electronic thermostats usually are more energy efficient because they can be programmed to lower room temperatures at pre-set times. In Indiana, a number of heating, ventilation, and air conditioning contractors participate in a program with IDEM to collect any brand of used mercury-containing thermostats. A list of participating providers is in Chapter 7: Resources. Call IDEM for the most up-to-date list at (800) 988-7901.
- ' **Replace mercury thermometers with digital thermometers or alcohol (red or blue bulb) thermometers.** Digital or alcohol-filled thermometers are as accurate as mercury thermometers (silver-colored liquid) for most applications. If your mercury thermometer breaks, evacuate and ventilate the room. FOLLOW THE MERCURY CLEANUP PROCEDURES ON THE NEXT PAGES. You can purchase spill clean-up kits at most safety supply companies. Check your local yellow pages.
- ' **Dispose of or recycle mercury waste properly.** There are no mercury disposal regulations that apply to Indiana child care facilities, unless you dispose of more than 220 pounds a month of products containing mercury, such as fluorescent bulbs, which would place you under hazardous waste disposal guidelines. Most child care facilities will not meet this 220-pound range. Although legally you can dispose of mercury-containing products in your municipal landfill, Indiana has developed a number of recycling and alternative disposal options to keep mercury out of our landfills and waterways. For more information on mercury-disposal options, contact your local solid waste management district (see Chapter 7: Resources). Many local solid waste management districts sponsor mercury and other household hazardous waste collection and recycling programs to keep mercury from accumulating in the waste stream. These are free to residences. Commercial establishments, such as child care facilities,

even if you operate a center out of your home, probably will be charged a small fee for recycling these hazardous materials. For instance, fluorescent light bulbs cost approximately \$0.40 a bulb to drop off at a recycling center (see “Recycle your fluorescent bulbs” below).

- ‘ **Recycle your fluorescent bulbs.** Fluorescent and other mercury vapor light bulbs are excellent environmental choices because they use up to 50% less electricity than incandescent lights. However, these bulbs contain mercury, so they must be handled carefully and disposed of properly. If broken, mercury vapor will be released into the air immediately. When a fluorescent bulb burns out, wrap it carefully in layers of newspaper, or store it in a box or its original container. Mark the container "Mercury Lighting for Recycling." Do not break or crush the bulbs or the mercury vapor will be released. **If a fluorescent bulb breaks, follow the mercury spill guidelines on the following page!** Take unbroken bulbs to a recycling center that collects household hazardous waste or pay a contractor to pick them up. See Chapter 7: Resources for a list of fluorescent bulb recyclers or call IDEM’s Office of Pollution Prevention and Technical Assistance for the most recent list at (800) 988-7901.
- ‘ **Prepare fish properly.** The Indiana Fish Consumption Advisory recommends what types of fish to avoid, what water bodies are at greatest risk, and the safest methods to prepare fish. See Chapter 7: Resources to obtain a copy of the advisory or brochure, “An Expectant Mother's Guide to Eating Fish.”

You should CONSIDER:

- ‘ **Recycling batteries.** Many libraries and most local solid waste management districts accept batteries, even those that contain mercury. Contact your local solid waste management district to find out where the closest battery recycling drop-off facility is located.
- ‘ **Educating families about the Indiana Fish Consumption Advisory.** Encourage them to read and use the advisory and discuss the fish they eat with their healthcare provider.

**IDEM Guidance for Mercury Spills:
Current Operating Procedures**

September 20, 1998

1. Safe mercury cleanup is important:

Mercury can be found in a variety of household items. When liquid mercury is spilled, it forms droplets that can accumulate in the tiniest places; these droplets can emit vapors into the air that we cannot see or smell. Mercury vapor in the air can be extremely toxic. Families have been poisoned from mercury spills in the home that have not been cleaned up properly. Children are at highest risk. The small amount of mercury in fever thermometers, thermostats, and fluorescent bulbs is not likely to cause serious health problems, but it should be cleaned up properly to avoid exposure.

2. When a mercury spill occurs:

- < NEVER use an ordinary vacuum or shop vacuum to cleanup mercury. The vacuum will put mercury vapor into the air and increase the likelihood of human exposure. The vacuum cleaner will be contaminated and have to be disposed of properly along with the spilled mercury.
- < NEVER use a broom or a paint brush to cleanup mercury. It will break the mercury into smaller beads and spread them around.
- < NEVER pour or allow mercury to go down a drain.
- < NEVER allow people whose shoes or clothing may be contaminated with mercury to walk around.

3. Steps to take before cleaning up a spill:

- < Contain the spill. Dike mercury (using rags or other disposable item) to prevent spreading. Divert from drains, cracks, and crevices.
- < Keep children and others away from spill area to prevent the spread of contamination.
- < Close doors to other indoor areas. Immediately ventilate spill area. Open doors and windows and use fans that exhaust outdoors. Keep air flowing through room with mercury spill but make sure it is ventilating outside.
- < Turn off heating, ventilating, or air conditioning systems that circulate air from the spill area to other parts of the house.
- < If you or any other person has come in contact with the mercury, stay in the area to prevent spreading contamination. Put contaminated clothing/shoes into a trash bag, wipe off any visible mercury beads

into the bag, then shampoo and shower well after cleanup is complete.

4. Questions that will be asked when a mercury spill call comes into IDEM's Spill Hotline (888-233-SPIIL):

\$ Are there children in the facility?

- < Remove them from the area.

\$ How much spilled? Big or little spill? (Big is anything over 10 grams of mercury. A thermostat ampule contains about 5 grams.)

- < If big, homeowner should call a contractor. If small (consumer product), follow cleanup directions below.

\$ What type of surface(s) is the spilled mercury on?

- > Hard or porous? Cracks or crevices?

If surface is hard, cleanup may be easier. A porous surface may be more difficult to clean, because the mercury can seep into porous surfaces, cracks, and crevices. In this case, the mercury cannot be completely removed and, if possible, should be sealed into the surface with epoxy paint or other sealing agent.

- < Accessible or difficult to reach? Can make the cleanup job a bit more difficult.
- < Disposable item? If item is removable, e.g. carpeting, rug, furniture cover, it should be removed and disposed of properly through the mercury recycling center closest to caller.

\$ What have you done already to try to cleanup the mercury? Did you use a vacuum cleaner on the spilled area?

- < How long used? The shorter, the better.
- < What size room? The bigger the better, if vacuum cleaner was used.
- < What to do with vacuum and bag? It cannot be cleaned, and it must be trashed. Unplug it and cut the cord at base so no one will use it. Triple bag with plastic and bring to local mercury collection site.

\$ Is your water disposal on a city sewer line or on a septic system?

- < If you are on a city sewer, your local wastewater treatment plant can handle small amounts of mercury if you accidentally get some down the drain, or if small amounts go down after rinsing mercury off your skin.
- < If you are on a septic system, all mercury-contaminated materials (including any water used) need to be cleaned up and collected. If mercury accidentally goes down a septic system, stop using the system and contact a professional.

5. Suggested equipment and supplies for a small spill cleanup:

All supplies used will be contaminated and cannot be cleaned and reused. These items must be disposed of properly after use and taken to the mercury recycling center.

- < rubber squeegee
- < plastic dust pan
- < plastic trash bags
- < zipper-shut plastic bags
- < flashlight
- < wide-mouth plastic container with tight lid
- < large tray or box
- < facial tissues, toilet paper, or paper towels
- < eye dropper
- < index cards, playing cards, or other disposable heavy paper
- < plastic wrap
- < sulfur powder
- < zinc or copper flakes

6. Cleanup Methods:

ANYTHING that comes in contact with mercury should be disposed of!

- < Push small mercury beads together with a card, stiff paper, or squeegee to form larger droplets. Push them into a plastic dust pan or use an eye dropper to pick up the mercury beads. Collect all mercury into a leak-tight plastic bag or wide-mouthed sealable plastic container.
- < Work from the outside of the spill area toward the center. Work over a tray or box that is lined or covered with plastic wrap when pouring mercury. Mercury's high density and smoothness cause it to roll fast. Use a flashlight to look all around in the areas of the spill. The light will reflect off the shiny mercury beads and make it easier to see them.
- < Sprinkle sulfur powder on the spill area after cleaning up beads of mercury; a color change from yellow to brown indicates that mercury is still present and more cleanup is needed.
- < Sprinkle zinc flakes or copper flakes (available at hardware stores) to amalgamate any small amounts of mercury which remain.

7. Follow-up checklist:

- T Wash your hands. Shower or bathe if other parts of your body may have contacted mercury.
- T Continue to air out the room with outside air for two days if weather permits.
- T If mercury is spilled in a regularly used area, you should consult your family doctor or local health department regarding mercury testing for your family.
- T Take all elemental mercury, mercury devices, and mercury-contaminated items to the nearest mercury recycling center.

Remember: Get an experienced professional to cleanup large spills!

2.7 PCBs

Polychlorinated biphenyls, or PCBs, have been used most widely in electrical transformers as a fire retardant. A transformer converts electrical power from one voltage to another. The majority of the transformers containing PCBs were installed in apartments, residential and commercial buildings, industrial facilities, college campuses, and shopping centers constructed before 1978. A transformer usually is a large box on a telephone pole or on outside ground that is connected to the main power line. (Use the Self Assessment to determine if your facility has a PCB transformer.)

PCBs also have been found in fluorescent lighting ballasts manufactured before 1978. A ballast is a dry transformer that boosts up the electrical current to start a fluorescent bulb. If your lighting fixtures were installed before 1978 or are not labeled "NO PCB," they probably contain PCBs.

Health Effects

It takes up to six years or more for the body to rid itself of PCBs. Fetuses exposed to PCBs during pregnancy may have lower birth weight, smaller head size, and delayed physical development. They can develop learning deficits and memory problems that are hard to detect until later years. Exposure to PCBs also has been found to cause skin lesions, tumors, and cancer.

When PCB fluid burns partially, which can occur when electrical transformers are on fire, the PCB fluid produces *dioxin*, which is more toxic to humans than the PCBs themselves. Dioxin has been shown to cause cancer in laboratory animals.

You MUST:



- ' **If you have a PCB transformer, it must be registered with fire response personnel. (U.S. EPA)**



- ' **If you have a PCB transformer, visually inspect it quarterly for oil leaks on the ground. (U.S. EPA)** If it is leaking, notify IDEM, your utility or county health department immediately.



- ' **Ensure that proper PCB identification labels are affixed to the transformer and any access materials. (U.S. EPA)**



- ' **Maintain records of inspections, maintenance, and disposal of a PCB transformer.** (U.S. EPA)
These records must be kept for three years after you have disposed of a PCB transformer.

You SHOULD:

- ' **Contact your local fire department if you notice any burning smell in your lighting ballasts.**

2.8 PESTICIDES

The overuse or inappropriate application of cleaning chemicals and pesticides can be a threat to children's health and the environment.

Pesticides are chemicals that are used to kill or control pests, including bacteria, fungi, weeds, insects, and rodents. Most pesticides are toxic, which means their purpose is to kill *something*. They may contain volatile organic compounds, which can be hazardous air pollutants that cause serious health and environmental effects.

Health Effects

Exposure to hazardous chemicals can endanger children's health because their smaller, rapidly developing bodies may be more sensitive to harmful chemicals. Scientific study on exposure to chemicals in pesticides is in the early stages, but great concern exists in the environmental and medical community that excessive exposure to pesticides at a young age can contribute to serious developmental problems.

Poisoning from these chemicals is too common. According to data collected from the American Association of Poison Control Centers, an estimated 74,000 children may have been involved in common household pesticide-related poisonings or exposures in the United States in 1994 alone.

Integrated Pest Management: A Comprehensive Approach

Recognizing the importance of protecting children from pesticide threats, a team of concerned individuals at Purdue University, Indiana University, and the Monroe County Community School Corporation has developed a program to reduce young Hoosiers' exposure to pesticides in schools and child care facilities. The foundation of the program is **integrated pest management (IPM)**. IPM is a cluster of tools, based on prevention, to combat pests with more than sole reliance on pesticides, including:

- < **Mechanical controls:** ensuring that pests are kept out with screens, weather-stripping, repairing cracks and holes, using sealable plastic containers to store food, fly strips
- < **Cultural controls:** cleaning and sanitation
- < **Education:** knowing the difference between "good" and "bad" bugs, pest identification and monitoring, and training staff
- < **Hormonal controls:** the use of hormones rather than toxicants to kill bugs
- < **Pesticides:** the judicious use of pesticides when necessary.

Integrated pest management doesn't have to be "one more thing" a child care administrator needs to add to an already full plate of facility management. The variety of non-chemical tools can be incorporated into ongoing custodial and maintenance activities, such as sanitation, energy conservation and building security, training of staff, and educational programs for children. It is a proactive, holistic approach in contrast to the reactive nature of chemical treatment strategies. In fact, over time pests may become resistant and build-up greater tolerance to chemicals used on them repeatedly.

You MUST:

- ' **Never spray pesticides when children or staff are present.** (FSSA) Never allow a pest control operator or certified staff to spray when children or staff are present. Follow the directions on the label to learn when it is safe for children and staff to return to the room or building after pesticide application.



- ' **Prevent entryways for pests.** (FSSA) The Child Care Health Section requires that you prevent the entry of insects and/or rodents with 16-gauge mesh screen on outside openings. FSSA also requires that you apply sealant around pipes, plumbing, ducts, and on cracks.



- ' **Clean.** (FSSA) The Child Care Health Section also requires that facilities are in neat, clean, orderly, and sanitary condition to minimize pest attraction to food sources or standing water. For example, there should not be food crumbs, food should be stored securely and off the floor, vents must be free of grease, and your cleaning schedule must be posted. Pest infestations are directly related to the availability of food and water.



- ' **Contract with a licensed pest control operator as necessary.** (FSSA) If insects and rodents become a problem, meaning they persist despite the techniques described above, the Child Care Health Section requires that you contact a pest control operator. The contractor must be licensed by the state. For verification of proper licensing, contact:

Office of Indiana State Chemist
Purdue University
1154 Biochemistry
West Lafayette, IN 47907
(765) 494-1594; (765) 494-4331 (fax)
Contact: David Scott, Pesticide Administrator



- ' **READ LABELS and use products correctly.** (IOSHA) State and federal laws require that you use the product labeled specifically for the pest and treatment site. For example, if you have an indoor ant problem, use a pesticide labeled for indoor ant control. Do not use a product labeled for outdoor use, lawns, or agricultural use. Store pesticides in their original containers and in a secure site accessible only to authorized staff. (*See the OSHA requirements for training staff on the proper use of chemicals in the next chapter, Safety and Sanitation, Section 3.4.*)



- ' **Store all pesticides and other chemicals properly.** (FSSA) Licensed child care centers must store all pesticides, cleaning supplies, and hazardous articles in locked areas that are inaccessible to children. Ministries and homes do not have to lock the chemicals but they must be in areas that are inaccessible to children.

You SHOULD:

- ' **Allow pesticides to be applied only by staff trained and certified by the state if you do not hire a licensed pest control operator.** Purdue University in West Lafayette offers training and testing. To sign up for Purdue's one-day training, contact the Purdue Pesticide Program office at (765) 494-4566. In lieu of classroom training, you can purchase training manuals from Purdue University's Media and Distribution Center by calling (765) 494-6794. There is no charge for the test; nominal fees are charged for training and materials.
- ' **Store food properly.** Store food in sealable containers, such as sealable plastic containers or zipper lock bags. All food products on open shelves should be stored 16"-18" from the wall or in cabinets. Allow the distance of a full broom sweep between the bottom shelf and floor of shelves. Do not store food products on the floor or in cardboard boxes, which are havens for rodents and cockroaches. Rotate your food stock and clean food storage areas vigilantly, especially beneath and behind shelves. Keep trash covered. Food stored in classrooms should be in sealable containers. To avoid roaches, do not store food in cardboard or paperboard boxes.
- ' **Eliminate water sources.** Keep mops off the floor, ensure floor drains are clear and sinks and counters are dry after use. Mosquitos can breed in water accumulating in puddles or buckets outdoors. If tires are used for swings or climbing devices, drill small holes in them to prevent water collection.
- ' **Request that your pest control operator use Integrated Pest Management strategies.** Purdue University has guidance for pest control companies. (See Chapter 7: Resources.)
- ' **Wash fresh fruits and vegetables with running water before eating.** Wash and scrub all fresh fruits

and vegetables thoroughly under running water, which has an abrasive effect that soaking alone does not. Washing will help remove bacteria and traces of pesticides; however, not all pesticides residues can be removed washing. You may need to peel fruits and vegetables when possible to reduce dirt, bacteria, and pesticides. Discard outer leaves of leafy vegetables.

- ' **Educate staff on pest issues.** Staff should familiarize themselves with the principles of integrated pest management: identifying and monitoring pests, sanitation, mechanical controls, and licensing requirements to apply pesticides.

You should CONSIDER:

- ' **Developing a written strategic pest control plan.** You can work with your licensed contractor on this plan, which will be your policy for handling pests with as few toxic chemicals as possible.
- ' **Educating families on the hazards of improper pesticide use.** Hold a workshop or send information home to parents about the potential for pesticide poisoning and how to incorporate IPM strategies into their house cleaning and maintenance. See Chapter 6: Environmental Stewardship for tips on communicating with parents.

